Claims

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a mannose-specific adhesin, whereby the nucleotide sequence is selected from the group consisting of:

(a) nucleotide sequences encoding a polypeptide comprising an amino acid sequence that has at least 60 % sequence identity with the amino acid sequence of SEQ ID NO. 1;

(b) nucleotide sequences comprising a nucleotide sequence that has at least 60% sequence identity with the nucleotide sequence of SEQ ID NO. 2;

(c) nucleotide sequences the complementary strand of which hybridises to a nucleic acid molecule sequence of (a) or (b);

(d) nucleotide sequences the sequence of which differs from the sequence of a nucleic acid molecule of (c) due to the degeneracy of the genetic code.

2. An isolated nucleic acid molecule according to claim 1, wherein the nucleotide sequence encodes a variant or fragment of the mannose-specific adhesin and whereby the variant or fragment is capable of binding mannose.

3. A vector comprising a nucleic acid molecule according to claim 1 or 2.

4. A vector according to claim 3, wherein the nucleic acid molecule is operatively linked to at least one regulatory DNA element allowing the expression of said nucleic acid in a prokaryotic or a eukaryotic cell.

5. A host cell comprising a nucleic acid molecule as defined in claim 1 or 2, or a vector as defined in claim 3 or 4.

6. A host cell according to claim 5, whereby the host cell is a Gram-positive bacterium.

7. A host cell according to claim 6, whereby the host cell belongs to a genus selected from the group consisting of *Lactobacillus, Lactococcus, Leuconostoc, Carnobacterium, Bifidobacterium, Pediococcus, Bacillus, Streptococcus*.

8. A host cell according to any one of claims 5 – 7, whereby the nucleic acid molecule confers to the host cell the ability to adhere to human cells.

9. A composition comprising a host cell as defined in claims 5 or 6 and a pharmaceutically or physiologically acceptable carrier.

10. An isolated polypeptide having an amino acid sequence that has at least 60 % sequence identity with the amino acid sequence of SEQ ID NO. 1.

11. A polypeptide which is a fragment or a variant of the polypeptide of claim 10, whereby the fragment or variant is capable of binding mannose.

12. A composition comprising a polypeptide as defined in claims 10 or 11 and a pharmaceutically or physiologically acceptable carrier.

13. A method for producing a polypeptide as defined in claims 10 or 11, the method comprising the steps of:
a) culturing a host cell as defined in any one of claims 5 – 8 under condition conducive to the expression of the polypeptide; and,
b) recovery of the polypeptide.

14. A method for producing the composition of claim 12, the method comprising the steps of claim 13 and further comprising the step of mixing the polypeptide with a pharmaceutically or physiologically acceptable carrier.

15. A method for producing the composition of claim 9, the method comprising the steps of:
a) culturing a host cell as defined in any one of claims 5 – 8; and,
b) mixing the host cell with a pharmaceutically or physiologically acceptable carrier.

16. A method for treating or preventing a bacterial infection of the gastrointestinal tract, the urinary tract, or the vagina comprising administering to a patient in need of such treatment an effective amount of a composition as defined in claims 9 or 12.

17. A method according to claim 16 whereby by the bacterial infection is caused by a bacterium which expresses type 1 fimbriae.

18. Use of a host cell as defined in any one of claims 5 – 8, or a polypeptide as defined in claims 10 or 11 for the manufacture of a medicament for the treatment or prevention of a bacterial infection of the gastrointestinal tract, the urinary tract, or the vagina.

19. A use according to claim 18, by the bacterial infection is caused by a bacterium which expresses type 1 fimbriae.

20. A method for determining whether a bacterium has the ability to bind mannose, whereby the method comprises determining the presence or absence of a nucleotide sequence as defined in claim 1 and whereby the presence of the nucleotide sequence is indicative of the ability to bind mannose.